

#### **DEPARTMENT OF PLANNING & BUILDING**

#### **BUILDING DIVISION**

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# SPAN TABLES: ROOF & FLOOR FRAMING

## **FORM 4602**

Lumber Grade		ALLOWABLE SPANS FOR JOIST & RAFTERS								
Douglas Fir Larch No. 2		Floor Joists		Ceiling Joist		Rafter Ceiling Joist Combination <sup>2, 3, 4</sup>		Rafters <sup>3, 4</sup>		
Finish or Slope		Plaster Be- low	Drywall Below	Plaster Be- low	Drywall Below	Plaster Be- low	Drywall Below	Slope less than 4' x 12'	Slope 4' x 12' or more	
Deflection Limit		L/360 w/LL	L/360 w/LL	L/360 w/LL	L/240 w/LL	L/360 w/LL	L/240 w/LL	L/240 w/LL	L/180 w/LL	
Load Duration Fac- tor		1.00	1.00	1.00	1.00	1.25 5	1.25 5	1.25 5	1.25 5	
Nominal Size Inches	Spacing Inches	DL=20PSF LL=40PSF	DL=10PSF LL=40PSF	DL=5PSF LL=10PSF	DL=5PSF LL=10PSF	DL=15PSF LL=20PSF	DL=15PSF LL=20PSF	DL=15PSF LL=20PSF	DL=15PSF LL=20PSF	
	12			9'-3"	9'-3"	7'-6"	7'-6"	7'-6"	7'-6"	
2 X 4	16			8'-9"	8'-9"	7'-0"	7'-0"	7'-0"	7'-0"	
	24			7'-10"	7'-10"	6'-0"	6'-0"	6'-0"	6'-0"	
2 X 6	12	9'-6"	9'-6"	13'-0"	13'-0"	10'-6"	10'-6"	10'-6"	10'-6"	
	16	8'-0"	8'-6	12'-0"	12'-0"	10'-0"	10'-0"	10'-0"	10'-0"	
	24	6'-10"	7'-0"	11'-0"	11'-0"	9'-10"	9'-10"	9'-10"	9'-10"	
	12	12'-0"	11'-9	15'-9"	15'-9"	13'-0"	13'-0"	13'-0"	13'-0"	
2 X 8	16	10'-6"	11'-0"	14'-9"	14'-9"	12'-3"	12'-3"	12'-3"	12'-3"	
	24	8'-6"	9'-0"	13'-6"	13'-6"	11'-0"	11'-0"	11'-0"	11'-0"	
	12	13'-9"	14'-1"	18'-9"	18'-9"	15'-6"	15'-6"	15'-6"	15'-6"	
2 X 10	16	12'-6"	13'-1"	17'-9"	17'-9"	14'-6"	14'-6"	14'-6"	14'-6"	
	24	10'-6"	11'-0"	16'-0"	16'-0"	13'-3"	13'-3"	13'-3"	13'-3"	
2 X 12	12	15'-6"	16'-3"	21'-6"	21'-6"	18'-0"	18'-0"	18'-0"	18'-0"	
	16	14'-6"	15'-0"	20'-0"	20'-0"	16'-10"	16'-10"	16'-10"	16'-10"	
	24	12'-0"	12'-6"	18'-0"	18'-0"	15'-3"	15'-3"	15'-3"	15'-3"	
	12	18'-0"	18'-3"	N/A 1	N/A 1	N/A 1	N/A 1	N/A 1	N/A 1	
2 X 14	16	16'-0"	17'-0"	N/A 1	N/A 1	N/A 1	N/A 1	N/A 1	N/A 1	
	24	13'-6"	14'-0"	N/A 1	N/A 1	N/A 1	N/A 1	N/A 1	N/A 1	

#### **OPEN BEAM CEILING**

Nominal Size (Inches)	On Center Spacing (Inches)	DOUGLAS FIR LARCH NO. 2
4 X 4	24 32 48	7'-10" 7'-4" 6'-6"
4 X 6	24 32 48	11'-0" 10'-4" 9'-4"
4 X 8	24 32 48	13'-6" 12'-6" 11'-6"
4 X 10	24 32 48	16'-0" 15'-0" 13'-10

#### DESIGN VALUES:

Lumber Grade: D.F./Larch #2
Allowable Bending Stress: 900 psi
Allowable Shear Stress: 95 psi
Modulus of Elasticity: 1,600,000 psi

### FOOTNOTES:

1 "N/A" designation is for spans over 25 feet. Single pieces of sawn lumber of this length are generally special stock order items and have not been shown.

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  Minimum Slopes 1/4" in 12". Roof surfaces having a slope less than 1/4" in 12" are considered to be flat roofs. Flat roof s must be designed to accommodate potential ponding of water. This information bulletin shall not be used for the design of Flat roofs.
- 3 DL (Roof dead load) = 15 psf
- LL (Roof live load) = 20 psf
- <sup>5</sup> Load Duration Factor = 1.25 (no floor above).

TABLE 23-II-E-1-ALLOWABLE SPANS AND LOADS FOR WOOD STRUCTURAL PANEL SHEATHING AND SINGLE-FLOOR GRADES CON- TINUOUS OVER TWO OR MORE SPANS WITH STRENGTH AXIS PERPENDICULAR TO SUPPORTS  $^{1,\ 2}$ 

SHEATH	IING GRADES		FLOOR <sup>4</sup>			
		Maximum Span (inches)		Load <sup>5</sup> (pounds per square foot)		
Panel Span Rating	Panel Thickness (inches)					Maximum Span (inches
Roof/Floor Span		With Edge Support <sup>6</sup>	Without Edge Support <sup>6</sup>	Total Load	Live Load	25.4 for mm
12/0	5/16	12	12	40	30	0
16/0	5/16, 3/8	16	16	40	30	0
20/0	5/16, 3/8	20	20	40	30	0
24/0	3/8, 7/16, 1/2	24	207	40	30	0
24/16	7/16, 1/2	24	24	50	40	16
32/16	15/32, 1/2, 5/8	32	28	40	30	16 <sup>8</sup>
40/20	19/32, 5/8, 3/4,7/8	40	32	40	30	$20^{8,9}$
48/24	23/32, 3/4, 7/8	48	36	45	35	24
54/32	7/8, 1	54	40	45	35	32
60/48	7/8, 1, 11/8	60	48	45	35	48
SINGLE F	LOOR GRADES	ROOF <sup>3</sup>				FLOOR <sup>4</sup>
		Maximum Span (inches)		Load <sup>5</sup> (pounds per square foot)		
Panel Span Rating Panel Thickness (inches)						Maximum Span (inches
		With Edge Support <sup>6</sup>	Without Edge Support <sup>6</sup>	Total Load	Live Load	25.4 for mm
16 oc	1/2, 19/32, 5/8	24	24	50	40	16 <sup>8</sup>
20 oc	19/32, 5/8, 3/4	32	32	40	30	$20^{8,9}$
24 oc	23/32, 3/4	48	36	35	25	24
32 oc	7/8, 1	48	40	50	40	32
48 oc	13/32, 11/8	60	48	50	50	48

<sup>&</sup>lt;sup>1</sup>Applies to panels 24 inches or wider.

#### ALLOWABLE SHEATHING SPAN Maximum Spans Sheathing<sup>1</sup> **FLOOR** ROOF Solid 16" not applicable 1" Thick Nominal Spaced 2 16" not applicable 5'-6" 3 Supporting Ceiling 4'-0" 2" Thick Nominal No Ceiling 6'-6", <sup>3</sup> 4'-0"

#### FOOTNOTES:

- <sup>1</sup> Span of sheathing boards placed diagonally accross rafters or joists shall be measured along the longitudinal axis of the plank.
- <sup>2</sup> Shall be continuous over three or more supports and no board shall be less than six feet long.

<sup>&</sup>lt;sup>2</sup>Floor and roof sheathing conforming with this table shall be deemed to meet the design criteria of Section 2312.

<sup>&</sup>lt;sup>3</sup>Uniform load deflection limitations 1/180 of span under live load plus dead load, 1/240 under live load only.

<sup>&</sup>lt;sup>4</sup>Panel edges shall have approved tongue-and-groove joints or shall be supported with blocking unless 1/4-inch minimum thickness underlayment or 11/2 inches of approved cellular or lightweight concrete is placed over the subfloor, or finish floor is 3/4-inch wood strip. Allowable uniform load based on deflection of 1/360 of span is 100 pounds per square foot (psf) except the span rating of 48 inches on center is based on a total load of 65 psf 5Allowable load at maximum span.

<sup>&</sup>lt;sup>6</sup>Tongue-and-groove edges, panel edge clips [one midway between each support, except two equally spaced between supports 48 inches on center], lumber blocking, or other. Only lumber blocking shall satisfy blocked diaphgrams requirements.

<sup>&</sup>lt;sup>7</sup>For 1/2-inch panel, maximum span shall be 24 inches.

<sup>&</sup>lt;sup>8</sup>May be 24 inches on center where 3/4-inch wood strip flooring is installed at right angles to joist.

<sup>&</sup>lt;sup>9</sup>May be 24 inches on center for floors where 11/2 inches of cellular or lightweight concrete is applied over the panels.

<sup>&</sup>lt;sup>3</sup> Douglas Fir Larch No. 3 or better permitted.